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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/437,004	11/09/1999	STEPHEN CREANEY	1749/261	7396

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ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER	
BELLO, AGUSTIN	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/437,004	CREANEY ET AL.	
	Examiner	Art Unit	
	Agustin Bello	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olsen (U.S. Patent No. 5,623,355) in view of Vaziri (U.S. Patent No. 5,892,858).

Regarding claim 1, Olsen teaches a data communication link comprising a data transmitter station (reference numeral 10 in Figure 2) coupled by an optical communication channel (reference numeral 36 in Figure 2) to a data receiver station (reference numeral 14 in Figure 2), wherein the data transmitter station includes a multi-power-level optical source (reference numeral 34 in Figure 2 which produces at least two different power levels, L_on and L_off in Figure 3) connected to receive data words of n digital bits (column 3 lines 27-32) and arranged to encode different value bits (e.g. "1" and "0") of each word into different power levels (e.g. power level L_on for bit value of 1 and power level L_off for bit value of 0; column 3 lines 45-47) of a single signal (reference numeral 34 in Figure 2) having m optical power levels (e.g. L_on and L_off in Figure 3), the multi-power-level output signal (reference numeral 34 in Figure 2) of the optical source being transmitted along the optical communications channel (reference numeral 36 in Figure 2) to the data receiver station (reference numeral 14 in Figure 2), said data receiver station including a data-decoding receiver (reference numeral 22, 38 in Figure 2) arranged to receive and decode said multi-power level single signal into n bit digital words

(e.g. "Data_out" in Figure 2), and wherein said receiver station further comprises a received-signal condition monitor (reference numeral 16 in Figure 2) coupled by a control channel (reference numeral 20 in Figure 2) to a control device (reference numeral 18 in Figure 2) located in the data transmitter station (reference numeral 10 in Figure 2), said condition monitor being arranged to sense the level of a predetermined characteristic (e.g. "error rate" column 3 lines 6-17) of the signal received by the data-decoding receiver and consequently to transmit a control signal (column 3 lines 6-17) along the control channel (reference numeral 20 in Figure 2) to the control device (reference numeral 18 in Figure 2), said control device (reference numeral 18 in Figure 2) being adapted to control the power output of the optical source consistent with achieving a predetermined sensed level of said predetermined characteristic (column 3 lines 15-32). Olsen differs from the claimed invention in that Olsen fails to specifically teach that the system is arranged to encode different value words into different power levels there being more than two power levels, wherein different sequences of bits comprised of more than one bit are encoded into different power levels of the signal. However, Vaziri, in the same field of optical communication, teaches that this concept is well known in the art (Figure 1, Figure 2B). Vaziri discloses that duobinary modulation can be employed to encode a signal comprising a plurality of words, thereby allowing different value words to be encoded into 3 different power levels. Vaziri further teaches that different sequences of bits (e.g. "a+b" at the output of the summing circuit shown in Figure 2A in Figure 2B,) comprised of more than one bit are encoded into different power levels of the signal (e.g. 0, -1, +1 of Figure 2B). One skilled in the art would have been motivated to apply the method of Vaziri to the device of Olsen in order to increase the amount of data transmitted by the signal while reducing the bandwidth of the signal (column 5

lines 48-58 of Vaziri). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ Vaziri's method of duobinary modulation of words in the device of Olsen.

Regarding claim 4, Olsen teaches a data communication link as claimed in claim 1, wherein the control channel is any of a serial binary digital optical channel; a parallel binary digital optical channel; a serial binary digital electrical channel; a parallel binary digital electrical channel; a serial multilevel digital electrical channel; a parallel multilevel digital electrical channel; or an analog electrical channel (column 3 lines 11-15).

Regarding claim 5, Olsen fails to specifically teach that the bandwidth of the optical channel is the same as or greater than that of the control channel. However, Olsen suggests as much in that Olsen refers to the control command as "a simple control command" (column 5 lines 45-48) and further since Figure 2 of Olsen shows a much wider signal for the optical channel than the control channel. Furthermore, one skilled in the art would have been motivated to include a greater bandwidth for the optical channel than for the control channel in order to reduce the overall complexity and expense of the system. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide a bandwidth of the optical channel that is the same as or greater than that of the control channel in the system of Olsen.

Regarding claim 6, Olsen teaches a data communication link as claimed in claim 1, wherein the optical source is a laser (column 2 lines 51-55) or an LED and the drive current supplied to the optical source is tailored to the characteristics of the source by individually adjusting the current drive levels (column 4 lines 4-21) such that each of the optical power levels is sufficiently separated from the levels above and below it (e.g. power level L_on for bit value

of 1 and power level L_off for bit value of 0 seen in Figure 3) for the receiver to quantise each level and maintain an adequate bit error rate (column 4 lines 47-57), thus accommodating non-linear source output power versus drive current characteristics.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Olsen in view of Vaziri and Roulett (U.S. Patent No. 4,399,566).

Regarding claim 2, Olsen differs from the claimed invention in that Olsen fails to specifically teach that the predetermined characteristic is the DC level or the average optical power level of the signal received by the receiver, the sensed level being compared against a control or reference level to establish a difference and the arrangement is such that the control signal attempts to null that difference or a least to keep the difference within narrow predetermined limits. However, use of the claimed predetermined characteristic as a means for laser power control is well known in the art. Roulett, in the same field of endeavor, teaches it is well known in the art to use a predetermined characteristic such as the DC level or the average optical power level of the signal received by the receiver (column 3 lines 56-58), the sensed level being compared against a control or reference level (column 3 lines 58-64) to establish a difference (inherent in the function of the comparator) and the arrangement is such that the control signal attempts to null that difference or a least to keep the difference within narrow predetermined limits (column 3 lines 65-68). One skilled in the art would have been motivated to use the predetermined level according to the method of Roulett in the device of Olsen in order to establish and maintain a preferred average optical power for the laser diode. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use the predetermined level according to the method of Roulett in the device of Olsen.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Olsen in view of Vaziri and Jackson (U.S. Patent No. 5,345,230).

Regarding claim 3, Olsen teaches that in the event of a difference in the signal transmitted and received the control signal is arranged to increase or decrease the power output of the transmitter in order to reduce the error (column 3 lines 18-23), but differs from the claimed invention in that Olsen fails to specifically teach that the predetermined characteristic is the individual bit content of a multibit test word transmitted at preselected times with the condition monitor being preprogrammed with the bits of the test word against which the individual bits of the transmitted test word are compared. However, use of the claimed predetermined characteristic as a means for error determination is well known in the art. Jackson, in the same field of endeavor, teaches it is well known in the art to use a predetermined characteristic such as the individual bit content of a multibit test word transmitted at preselected times while having a condition monitor preprogrammed with the bits of the test word against which the individual bits of the transmitted test word are compared (column 7 lines 45-63). One skilled in the art would have been motivated to employ the error determining method disclosed by Jackson in the device of Olsen in order to compare a known test sequence with a transmitted test sequence, thereby providing increased accuracy in determining errors. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ the error determining method disclosed by Jackson in the device of Olsen.

Response to Arguments

5. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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